

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

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*Ex parte* JOSE M. SOSA, KENNETH P. BLACKMON  
and DOUG BERTI

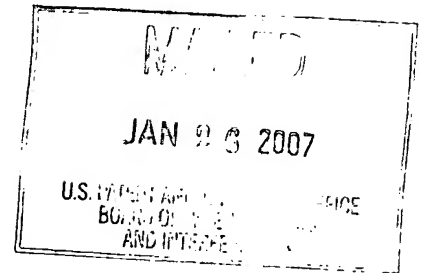
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Appeal 2006-2617  
Application 10/729,446  
Technology Center 1700

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ON BRIEF

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Before SCHEINER, MILLS, and GRIMES, *Administrative Patent Judges*.

GRIMES, *Administrative Patent Judge*.

**DECISION ON APPEAL**

This appeal involves claims to impact modified polystyrenes and methods for their preparation. The examiner has rejected the claims as anticipated and obvious. We have jurisdiction under 35 U.S.C. § 134. We affirm.

**BACKGROUND**

“Polystyrene is one of the largest volume thermoplastic resins in commercial production today.” (Specification 1.) However, unmodified polystyrene can be too brittle for certain applications. (*Id.*) “Thus, styrene-

based copolymers, and particularly polystyrene resins that are modified with organic rubber particles, have been investigated for use in applications requiring less brittleness. The modification of polystyrene to reduce brittleness is often referred to [as] increasing its impact properties and thus the modified polystyrene is said to have higher impact.” (*Id.*)

The acronym “HIPS” is commonly used to refer to these high impact polystyrene blends. (*Id.*) Polybutadiene rubber can be used as an impact modifier in HIPS materials. (*Id.* at 2.)

The specification discloses that an impact modified polystyrene having a haze value of 12 percent or less can be prepared by dissolving a styrene-butadiene-styrene block copolymer in styrene monomer, and polymerizing the styrene monomer. (Specification 3.) A chemical initiator can be used in the polymerizing step, or polymerization can be initiated thermally. (*Id.* at 7-9.)

## DISCUSSION

### 1. CLAIM CONSTRUCTION

Claims 1-30 are pending and on appeal. Appellants do not argue the claims separately. Therefore, the claims subject to each rejection stand or fall together. 37 CFR § 41.37(c)(1)(vii).

Claims 18 and 19 are representative and read as follows:

18. A process for preparing an impact modified polystyrene comprising dissolving a styrene-butadiene-styrene block copolymer in styrene monomer and polymerizing the styrene monomer wherein the impact modified polystyrene has a haze value of less than or equal to 12 percent.

19. The process of Claim 18 wherein the polymerization is initiated thermally.

## 2. ANTICIPATION

Claims 1, 5, 8, and 18 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Sosa.<sup>1</sup>

The Examiner states that Sosa “discloses a process for producing an impact rubber modified polystyrene composition comprising a styrene-butadiene-styrene (SBS) block copolymer . . . and polymerizable vinylaromatic hydrocarbon monomer . . . .” (Answer 4-5.) The Examiner notes that Sosa’s product is transparent, and therefore meets the limitation requiring a haze value of less than or equal to 12 percent. (*Id.* at 5.)

As stated in *Gechter v. Davidson*, 116 F.3d 1454, 1457, 43 USPQ2d 1030, 1032 (Fed. Cir. 1997), “[u]nder 35 U.S.C. § 102, every limitation of a claim must identically appear in a single prior art reference for it to anticipate the claim.”

We agree with the Examiner that Sosa anticipates claim 18. Sosa discloses a process of making “Transparent Impact PolyStyrene, or TIPS,” a “class of materials which are made from various copolymers and styrene monomer.” (Sosa, col. 1, ll. 29-31.) Sosa’s TIPS materials are made “from an elastomer and a monovinylaromatic polymer.” (Sosa, col. 4, ll. 1-3.)

As the elastomer component, Sosa states that “TIPS can be manufactured . . . by selecting appropriate SBS [(styrene-butadiene-styrene)] structures that will form lamellar or rod morphologies.” (Sosa, col. 4, ll. 24-27.) We also note that Sosa exemplifies preparing TIPS with the elastomer “Finaclear 530” (Sosa, col. 6, ll. 56-66), a product described on page 14 of Appellants’ Specification as “a tapered triblock styrene-butadiene-styrene

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<sup>1</sup> Sosa et al., U.S. Patent 6,437,043 B1, issued August 20, 2002

copolymer.” Thus, Sosa discloses that the starting material recited in claim 18, a styrene-butadiene-styrene block copolymer, can be used as the elastomer component of the TIPS material.

After the elastomer has been prepared within a diluent solvent, Sosa discloses that the solvent-elastomer mixture “is then sent to the solvent exchange section where the diluent is replaced by or ‘exchanged’ with styrene monomer.” (Sosa, col. 4, ll. 41-43.) Sosa therefore describes claim 18’s step of “dissolving a styrene-butadiene-styrene block copolymer in styrene monomer.”

Sosa discloses that once the styrene monomer has replaced the diluent solvent, the elastomer-styrene monomer mixture is sent to a TIPS reactor system to be polymerized. (Sosa, col. 4, ll. 44-57.) Sosa further discloses that “[t]he structure of the rubber particles in TIPS material is smaller than the wavelength of visible light, thereby allowing light to pass through the material unhindered, rendering the final product transparent . . . .” (Sosa, col. 4, ll. 64-67.)

Thus, as we understand it, Sosa describes a process in which the starting material recited in claim 18 is subjected to the two process steps recited in claim 18, resulting in a product having the physical properties recited in the claim.

Appellants argue that the Examiner maintained the anticipation rejection, despite having “concurred” in a personal interview on January 12, 2005,<sup>2</sup> that Sosa’s composition is not identical to that claimed. (Br. 3.)

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<sup>2</sup> Examiner Interview Summary Record, dated January 12, 2005. The date of this document in the electronic file wrapper is April 11, 2005.

However, as discussed *supra*, we agree with the Examiner that Sosa describes a process using a starting material encompassed by Appellants' claim 18. We therefore also agree with the Examiner's decision to maintain the anticipation rejection over Sosa, despite whatever transpired in the interview of January 12, 2005.

Appellants also argue that their claimed impact modified polystyrene is a "High Impact Polystyrene" as defined in the Specification in at least paragraphs [0003], [0004], and [0015], whereas Sosa's product is a "Transparent Impact Modified Polystyrene (TIPS), which is not the same product as HIPS, regardless of whether the HIPS is transparent." (Br. 3.)

Appellants urge (Br. 3-4, Reply Br. 2) that Sosa explicitly distinguishes between TIPS and HIPS by stating as follows:

The primary difference between a HIPS material and a TIPS material arises from the difference in the morphologies of the two materials' rubber phases. In the HIPS material, the rubber is present as a distribution of different sized, well-defined spherical particles, ranging from about 0.5 up to about 15 microns in diameter. In TIPS materials the rubber phase is present in "domains" that have dimensions that will not refract visible light, and therefore appear to the human eye as transparent.

(Sosa, col. 1, ll. 30-40.)

We do not find Appellants' argument persuasive. A reference which discloses all of the elements in a claim anticipates that claim, even if it does not use the same terminology as the claim. *In re Bond*, 910 F.2d 831, 832-833, 15 USPQ2d 1566, 1567 (Fed. Cir. 1990) ("The[] [claimed] elements must be arranged as in the claim under review, but this is not an 'ipsissimis verbis' test.") (citations omitted).

Thus, as discussed *supra*, Sosa describes a process in which a starting material meeting the limitations recited in claim 18 is subjected to both of the process steps recited in claim 18. Because it is transparent, the resulting product meets claim 18's haze limitation of less than or equal to 12 percent. We see nothing in the cited paragraphs, or anywhere else in the Specification, that requires the "impact modified polystyrene" made by claim 18's process to have any components other than the styrene-butadiene-styrene elastomer and polystyrene present in Sosa's final product.

We note that Sosa states that HIPS can be distinguished from TIPS because the rubber component of HIPS "is present as a distribution of different sized, well-defined spherical particles, ranging from about 0.5 up to about 15 microns in diameter." (Sosa col. 1, ll. 34-37.) However, as pointed out by the Examiner (Answer 8), Appellants' claims do not contain any limitation with respect to the particle size of the rubber component within the claimed polymer. Claim 18 is therefore not distinguishable from Sosa on this basis.

Appellants further argue that Sosa's TIPS materials are prepared "using an elastomers reactor system that is unique to TIPS manufacture." (Br. 4.) However, claim 18 does not contain any limitation regarding the apparatus used to practice the claimed process. Claim 18 therefore does not exclude the use of Sosa's apparatus.

To summarize, the fact that the reference uses the term "TIPS" to describe the final product does not negate the fact that Sosa describes a process in which a starting material identical to that recited in claim 18 is subjected to the steps recited in the claim. Sosa's final product is transparent

and therefore reasonably appears to be a product having a haze value of 12 percent or less.

Because Sosa describes a process having all of the steps recited in claim 18, we affirm the anticipation rejection claim 18. Claims 1-5 and 8 fall with claim 18.

### 3. OBVIOUSNESS

Claims 6, 7, 9-17, and 19-30 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Sosa in view of Bowen.<sup>3</sup>

The Examiner acknowledges that Sosa differs from claim 19 in that Sosa “does not disclose . . . a process condition wherein the reaction can be initiated thermally . . . .” (Answer 6.) To meet this limitation, the Examiner cites Bowen as disclosing a process in which styrene monomer is dissolved in a styrene-butadiene-styrene triblock copolymer, and “[t]he polymerization of styrene monomer is initiated thermally.” (*Id.*)

The Examiner may establish a *prima facie* case of obviousness based on multiple references “only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references.” *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). While the reason for practicing the claimed subject matter may be explicit from the prior art, “the teaching, motivation or suggestion may be implicit from the prior art as a whole, rather than expressly stated in the references. The test for an implicit showing is what the combined teachings,

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<sup>3</sup>Bowen, U.S. Patent 5,633,318, issued May 27, 1997

knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art.” *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000) (citations omitted).

We agree with the examiner that the teachings of Sosa and Bowen would have made the process recited in claim 19 obvious to one of ordinary skill. In a process of polymerizing styrene monomer with a styrene-butadiene copolymer, Bowen states that “[t]ypically, polymerization of the styrene monomer is initiated in this process thermally, although a chemical initiator may also be used for this purpose.” (Bowen, col. 3, ll. 64-67.)

Thus, Bowen’s and Sosa’s processes are both directed to polymerizing styrene monomer with elastomers containing styrene and butadiene. The disclosure that heat was a suitable method of initiating styrene polymerization in Bowen’s process would have suggested to one of skill in the art that heat was also a suitable method of initiating styrene polymerization in Sosa’s process. One of ordinary skill practicing Sosa’s process would therefore have been motivated by Bowen to thermally initiate the polymerization of styrene monomer, as recited in claim 19.

Appellants again argue that Sosa “teaches a Transparent Impact Polystyrene, not HIPS.” (Br. 4.) Appellants further argue that rather than teaching a HIPS material having a haze value of less than 12 percent, Bowen “teaches an opaque film.” (*Id.*) Thus, argue Appellants, “there is no motivation to combine *Bowen* with *Sosa* ‘043 for the purpose of providing the missing limitations in *Sosa* ‘043 (e.g., HIPS.)” (*Id.*)



We do not find Appellants' argument persuasive. As discussed *supra*, in our view, claim 18 is sufficiently broad to encompass Sosa's process of making TIPS materials.

Thus, claim 19 differs from Sosa only in that Sosa does not disclose using thermal initiation in the step of polymerizing the styrene monomer. Because Bowen discloses that thermal initiation is a useful method of inducing polymerization of styrene monomer (Bowen, col. 3, ll. 64-67), we agree with the Examiner that claim 19 would have been obvious over Sosa and Bowen.

We therefore affirm the obviousness rejection of claim 19. Claims 6, 7, 9-17, and 20-30 fall with claim 19.

#### SUMMARY

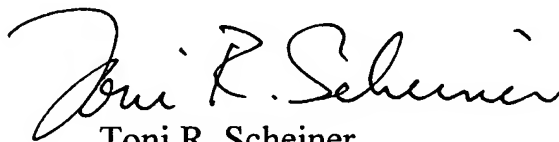
Because Sosa discloses a process having all of the elements recited in claim 18, we affirm the anticipation rejection of claims 1-5, 8 and 18.

Because Sosa and Bowen suggest all of the limitations recited in claim 19, we affirm the obviousness rejection of claims 6, 7, 9-17, and 19-30.

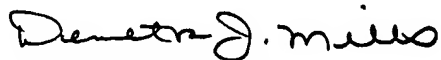
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Application No. 10/729,446

No time period for taking any subsequent action in connection with  
this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED



Toni R. Scheiner )  
Administrative Patent Judge )



Demetra J. Mills )  
Administrative Patent Judge )

) APPEALS AND



Eric Grimes )  
Administrative Patent Judge )

) BOARD OF PATENT

) INTERFERENCES

EG/dm

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FINA TECHNOLOGY INC  
PO BOX 674412  
HOUSTON TX 77267-4412